gaming environment), is rendered to fit within the size of the first game window. In **1104**, the rendered first two-dimensional projection surface is displayed in the first game window on the display screen.

[0149] In **1106**, the first game window is reduced to a second size. In **1108**, the same game window content is rendered to fit within the reduced first game window. The game window content of the first game window may be held constant during a game window size transition but may be later varied after the transition of the game window to the new size. Therefore, a second projection surface derived from the same 3-D coordinates of the surface in the 3-D gaming environment as in **1102** is rendered accounting for the new window size. In **1111**, the second two-dimensional projection surface is displayed in the reduced first game window on the gaming machine.

[0150] To account for a change in game window size, the rendering may involve adjusting the parameters of a transformation performed by a virtual camera in the 3-D gaming environment to produce a "photograph" that fits in the window. This transformation may be performed while the 3-D coordinates of a captured surface in the 3-D gaming environment remain constant. In addition, the transition between the first game window size and the second game window size may be gradual. Thus, the first game window may be rendered in a series of sizes going from the first size to the second size where the 3-D coordinates of the captured surface in the 3-D gaming environment remain constant but the "photograph" from the virtual camera is rendered to fit in each of the window sizes generated during the transisition. The method is not limited to reducing the size of game windows and may also be applied to increasing the size of game windows.

[0151] In **1112**, one or more new game windows may be generated in the display space created by the reduction in size of the first game window. In **1114**, information such as but not limited to game information, attract information, entertainment content, player preference information and gaming machine operational information may be displayed in the new game windows. In one embodiment, the new game windows may be removed and the first game window may be returned to its original size.

[0152] An input location on a display screen of a gaming machine is often an important parameter for operating a gaming machine. The input location on the display screen may be used to determine whether an input button modeled on the display screen has been activated. The input location on a display screen may be determined from a cursor location on the display screen or an input to a touch screen on top of the display screen. The cursor may be moved by a mouse, touch pad or joystick on the gaming machine. Then, a input location of the cursor may be specified by using an input mechanism on the gaming machine. For instance, a user may hit an "enter button" on a mouse or a joy-stick.

[0153] In traditional gaming machines, the position of input buttons or input surfaces modeled on a display screen on the gaming machine are fixed. As described above, input buttons that may be used with a touch screen or a screen cursor and screen cursor controller may be modeled in a 3-D gaming environment. In the present invention, the position of these buttons on the display screen may vary as a function of time. For instance, the position of an input button or input surface modeled in a 3-D gaming environment may change on the display screen when a position of a virtual camera in the 3-D gaming environment is changed or an object in the 3-D gaming environment is moved. The position of the input buttons may change as a result of user input into the gaming machines or some other game event. For instance, the position of the button on the display screen may be change or an area occupied by the input button on the display screen may change as a view of the input button is changed. Thus, methods are needed to account for a change of position or size of an input button modeled on the display screen to determine when an input button has been activated. A few methods of accounting for input buttons with variable positions and sizes are described as follows with respect to FIGS. **12A-12E** and **FIG. 13**.

[0154] FIGS. **12A-12E** are perspective drawings of screen input interfaces modeled in a 3-D gaming environment on a gaming machine. In **FIG. 12A, a** game display **158** is on a surface **156** comprising a plurality of elements **152** modeled in a 3-D gaming environment with coordinate system **150**. A 3-D dimensional input button **159** is also modeled in the game display **158**. A virtual camera **154** is positioned in the game environment and used to render a photograph of the game display **158** with the input button **159**. In **FIG. 12** B, the rendered photograph **160** is displayed in game window **161** which maybe displayed on a portion of a display screen on a gaming machine. The game window **161** has dimensions I by J which may correspond to a pixel length and a pixel width on the gaming machine. The game window **161** may be divided up into a 2-D grid of pixel locations. The input button **159** occupies a certain number of pixels on the game window **161**.

[0155] In **FIG. 12C, a** screen input is detected at the screen location specified by the cross hairs **164**. The screen input may be generated by a touch screen or some other input device on the gaming machine. In one embodiment of the present invention, the 2-D coordinates of the screen location and knowledge of the transformation used to render the 2-D view from the 3-D virtual gaming environment on the display screen may be used to generate a line in the 3-D gaming environment.

[0156] In **FIG. 12**D, an "input line"**165** is generated in the 3-D gaming environment from the 2-D coordinates of the screen location at **164** and a transformation used to render the 2-D view **166** in the game window **161** in **FIG. 12C**. The coordinates of the "input line" are checked to determine whether the input line intersects with an input button modeled in the 3-D gaming environment. In **FIG. 12**D, the line **165** intersects with input button **159**. When the "collision" is detected, the gaming machine may determine whether the input button is "active." When the input button is active, the gaming machine may implement a gaming event specified by the input button. For instance, the gaming event may be to initiate a game on the gaming machine. When the input button is not active, the gaming machine may ignore the collision. When a non-rectangular coordinate system is used to model the 3-D gaming environment, the input line may not be straight and may be a curved line. Often the input line is referred to a as a ray and determining whether a collision has occurred is referred to as casting a ray.

[0157] After a collision has been detected on an "active" input button, the input button may be animated in some